CLAIMS

What Is Claimed Is:

1. An improved collet assembly for holding a tool shaft, comprising:

a collet defined by an axial collet bore adapted to receive said shaft, and a plurality of tabs integral to said collet and adjacent to said bore; and

a collet housing including an axial housing bore adapted to receive said collet and further including a tapered portion, whereby said tabs cooperate with said tapered portion to hold said tool shaft.

2. The collet assembly of Claim 1, wherein:

said collet comprises:

a spindle;

a center portion extending from said spindle and comprising said tabs; and

a collar adjacent to said center portion; and

wherein said axial collet bore penetrates said collar and said center portion.

3. The collet assembly of Claim 2, wherein said center portion further comprises a plurality of struts extending between said spindle and said collar.

4. The collet assembly of Claim 3, further comprising a biasing means for biasing said tabs towards said tapered portion.

5. The collet assembly of Claim 4, wherein said biasing means exerts biasing force at said collar.

6. The collet assembly of Claim 5, wherein:

said collet housing further comprises a first end and a second end, with said axial housing bore extending from said first end to said second end;

said collet assembly further comprises a retainer attached in said housing bore between said first end and said biasing means; and

said spindle extends out of said second end.

7. The collet assembly of Claim 6, wherein said collet comprises a unitary piece.

8. A process for manufacturing an improved collet for rotating tool shafts, comprising:

drilling an axial hole in a piece of metal stock having an axis and a circumference;

cutting a plurality of tabs around said circumference; and

reaming said hole to accept said shafts, whereby said tabs deflect outwardly during said reaming step to avoid being cut.

9. The process of Claim 8, wherein said cutting comprises:

drilling a plurality of transverse apertures around said circumference;

cutting a plurality of axial slots around said circumference substantially tangential and bracketing each said aperture to form a plurality of struts and said tabs.

10. The collet assembly of Claim 7, wherein:

said tabs are further defined by inner surfaces for holding the tool shaft and outer surfaces for engaging said tapered portion, said inner surfaces being curved convexly, and said outer surfaces being curved concavely; and

said struts are further defined by inner surfaces and outer surfaces, said inner surfaces being curved convexly.

~~11.~~ 9 The collet assembly of Claim ~~10~~ 8, wherein:

said collet defines a longitudinal axis;

said strut outer surfaces are defined by at least one flat surface defining a strut angle between said strut outer surfaces and said axis, said strut angles being substantially equal to each other; and

said tab outer surfaces are define a tab angle between said tab outer surfaces and said axis, said tab angles being substantially equal to each other; and

wherein each said tab angle is different from each said strut angle.

~~12.~~ 10 The collet assembly of Claim ~~11~~ 9, wherein:

each said tab angle is less than each said strut angle.

~~13.~~ 11 The collet assembly of Claim ~~12~~ 10, wherein:

each said tab angle is 4.3 degrees; and

each said strut angle is 5.0 degrees.

14. A process for manufacturing an improved collet for rotating tool shafts, comprising:

drilling an axial hole in a piece of metal stock having an axis and a circumference;

cutting a plurality of tabs and struts having outer surfaces, around said circumference;

a first grinding of said outer surfaces of said tabs and said struts until said outer surfaces and define a tab angle to said axis; and

a second grinding of said outer surfaces of said struts such that said outer surfaces of said tabs protrude further outward from said axis than said outer surfaces of said struts.

15. The process of Claim 14, wherein said second grinding step further comprises grinding said strut outer surfaces until said outer surfaces define a strut angle to said axis.

16. The process of Claim 15, wherein said second grinding results in said strut angle being greater than said tab angle.

17. The process of Claim 16, wherein:

said first grinding results in said tab angles being 4.3 degrees; and

said second grinding results in said strut angles being 5.0 degrees.